

NEW AND UNFIGURED UNIONIDÆ.¹

BY CHARLES T. SIMPSON.

In preparing a synopsis of the *Naiades*, quite a number of new species of *Unionidæ* have come to light. These I have held until the work should be practically finished, and they are here published for the first time.

Messrs. S. H. and B. H. Wright having generously donated the types of most of their species to the National Museum, it was thought best to give figures of those which were described in *The Nautilus*, and which are unfigured.

Only brief descriptions are here given of the new genera and of a few used in a new sense. These will be fully described in the *Synopsis*.

Genus **LAMPSILIS** Rafinesque.²**Lampsilis fallaciosus** (Smith) Simpson. Pl. II, fig. 5.

Lampsilis fallaciosus Smith, Bull. U. S. Fish Com., 1899, p. 291, Pl. 79.
Figured and name given, but not described nor authority given.

Shell elongate elliptical, subsolid, inflated, rounded in front, and ending in a rather sharp point behind, at two-thirds of the height of the shell, with a moderate, rounded posterior ridge; beaks not prominent, their sculpture consisting of a few delicate parallel ridges, somewhat doubly looped, the hinder loops generally open behind; epidermis very smooth and shining, ashy straw color, often brownish on the back of the shell, generally feebly rayed with green; female shell decidedly swollen in the postbasal region, so that the base line is often incurved in front of the swelling; teeth rather delicate, there being one compressed pseudo-cardinal and one lateral in the right valve, and two pseudo-cardinals and two laterals in the left; beak cavities not deep; nacre brilliant, silvery.

Length 90, height 40, diam. 32 mm.

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²See Simpson in Baker, *Mollusks of the Chicago Area*, 1898, p. 93.

Upper Mississippi drainage; scuth to the Cumberland and Arkansas rivers; Red river of the North.

This species has generally been confounded with its near ally, *Lampsilis anodontoïdes* Lea. It is a smaller, more inflated, and in every way a more delicate form than the latter, it is not so high, the epidermis is brighter and more glossy, and generally rayed. The postbasal inflation of the female is usually more pronounced, and the posterior point is higher than in *anodontoïdes*. The latter is usually more yellow or tawny than *fallaciosus*, and is, on the whole, a heavier shell.

In *L. fallaciosus* there is a horny, brown, raised streak on the inside of the mantle behind, that I do not find in *anodontoïdes*, and the palpi of the former are shorter.

Lampsilis australis Simpson. Pl. II, fig. 2.

Shell long elliptical, subsolid, moderately inflated, bluntly pointed behind above the middle; beak sculpture not seen on account of erosion, posterior ridge low, rounded; epidermis smooth, shining, greenish yellow, rayed with green, with a large burnt brown patch on the central and upper part of the shell; female shell slightly inflated in the postbasal part; hinge teeth delicate, somewhat compressed; beak cavities moderate; nacre bright bluish white, iridescent behind, dark lurid in the cavity of the shell.

Length 52, height 28, diam. 15 mm.

Little Patsaliga creek, southeastern Alabama.

Both the type, a young shell, and an older, larger specimen are badly eroded at the beaks, so that the hinges are slightly injured. I am not positive as to the relations of this species, but it seems to belong in the *anodontoïdes* group, next to *L. rectus* Lam.

Lampsilis mearnsi Simpson. Pl. I, fig. 4.

Shell small, rather solid and inflated, elliptical, pointed at the middle of the posterior end, with a rather pronounced, rounded post ridge; beaks moderate, the sculpture consisting of several ridges looped in a single loop, which are strongly curved upward behind; epidermis tawny with a greenish tint, rather smooth and shining, though sometimes a little silky, often with a large, dark green blotch at the posterior base, which sometimes covers the entire posterior half of the shell, or it may break into rays at its front edge; female shell decidedly swollen at the postbase; hinge teeth

rather delicate; laterals curved; pseudo-cardinals smooth below and slightly reflexed upward; muscle scars distinct; beak cavities shallow; nacre brilliant, soft silvery, yellowish or salmon.

Length 53, height 30, diam. 22 mm.

Near Fort Clark, southwest Texas.

A large number of valves and several perfect specimens were contributed to the Museum by Dr. Edgar A. Mearns, of the U. S. Army. It is closely allied to *L. texasensis* Lea, but it has a higher posterior ridge, is much smoother, and the remarkable color pattern is totally different.

Lampsilis brittsi Simpson. Pl. V, figs. 1, 2.

Shell elliptical, subsolid, moderately inflated; beak sculpture not seen; epidermis smooth, shining, greenish yellow to tawny, with delicate wavy, often broken green rays; hinge line curved; pseudo-cardinals small, rather high but stumpy; laterals somewhat remote; muscle scars distinct; nacre whitish to salmon colored.

Animal: Marsupium occupying the hinder part of the outer gills, with 13-15 large ovisacs having dark bases; inner gills united to abdominal sac throughout; mantle with a thick border, incurved in the female behind the postbase, and having several strong, lengthened, fingerlike papillæ; palpi small; branchial and anal openings but slightly fringed.

Length 72, height 43, diam. 23 mm.

The female shell is decidedly emarginate behind the postbasal swelling.

Differs from *L. breviculus* in several respects. The female shell is more emarginate behind; the painting is in more regular, wide rays. The male shell of *breviculus* is obovate, rounded or slightly biangulate behind; that of *L. brittsi* is more elliptical and pointed posteriorly.

Lampsilis kirklandianus S. H. Wright. Pl. I, fig. 7.

Unio kirklandianus S. H. Wright, Naut., X, 1897, p. 136.

A wonderfully beautiful shell, of which I have only seen the type, apparently a male. It is very different from the ordinary manifestation of *Lampsilis*, but seems to be nearly related to the *Unio subangulatus* of Lea, which is nearer the typical form of the genus, and in which the difference between the male and female shells is clearly shown. The marsupium is of the *Lampsilis* type.

Lampsilis villosus B. H. Wright. Pl. I, fig. 1.

Unio villosus B. H. Wright, Naut., XII, 1898, p. 32.

A species close to the *Unio amygdalum* of Lea, but which also seems to be related to his *U. exiguus*.

Genus **MEDIONIDUS** Simpson.

Shell elongated, elliptic rhomboid, subsolid, with a more or less definite posterior ridge; beak sculpture fine, subparallel, broken, doubly looped ridges; epidermis smooth, rather bright, variegated with broken green rays or clouds; pseudo-cardinals small, stumpy; laterals curved; female shell generally slightly swollen at and behind the central base; marsupium occupying the centre and postcentre of the outer gills, in a few large, irregular, distinct ovisacs. Type *Unio conradicus* Lea.

Medionidus walkeri B. H. Wright. Pl. I, fig. 5.

Unio walkeri B. H. Wright, Naut., XI, 1898, p. 91.

A singular shell, but most probably related to *Unio rubellinus* of Conrad, which is a member of this genus.

Genus **NEPHRONAIAS** Crosse and Fischer.

Shell rather solid, elliptical, more or less biangulate behind, that of the male often becoming arcuate when old, that of the female generally swollen on the postbase; surface sulcate; beaks sculptured with faint, broken ridges; two pseudo-cardinals in each valve; laterals perfect; beak cavities rather deep.

Type *Unio plicatulus* Charpentier.

Nephronaias reticulatus Simpson. Pl. II, fig. 3.

Shell evenly elliptical, subinflated, rather solid, slightly biangulate behind; surface decidedly sulcate and sculptured throughout with radiating ridges or slight furrows, which cut the sulcations into loops, and give the shell a reticulated appearance; epidermis tawny; pseudo-cardinals stumpy; laterals rather heavy and granular; muscle scars distinct; nacre lurid, thicker in front.

Length 50, height 33, diam. 20 mm.

Patook river, Honduras.

A single shell, which is probably not fully adult, is in the National Museum collection. The sculpture reminds one of that of *Glabaris reticulatus* Sowb., of South America, or *Plagiola encarpa* Lea, of Lake Nicaragua.

Genus **OBOVARIA** Rafinesque.

Shell solid, inflated, short, rounded before and often behind, that of the female swollen at postbase; beaks high, their sculpture delicate and faint, slightly doubly looped; epidermis silky, but feebly rayed; pseudo-cardinals and laterals strong; animal having the marsupium in the hinder part of the outer gills with well-marked ovisacs.

Type *Unio retusa* Lamarek.

Obovaria rotulata B. H. Wright. Pl. IV, fig. 2.

Unio rotulatus B. H. Wright, Naut., XIII, 1899, p. 22.

A very solid shell, nearly circular in outline, and having a black epidermis. It seems to be closely related to the *Unio circulus* of Lea, but I have only seen a single specimen, the type.

Obovaria tinkeri B. H. Wright. Pl. IV, fig. 3.

Unio tinkeri B. H. Wright, Naut., XIII, 1899, p. 7.

A species near to the *Unio unicolor* of Lea, but probably distinct.

Genus **TRITOGONIA** Agassiz.

Shell elongate rhomboid, solid, that of the male somewhat swollen and truncate behind, that of the female longer, more compressed, and having a rounded posterior wing or flap; posterior ridge high and well defined; beak sculpture consisting of strong, irregular corrugations; surface covered with tubercles; epidermis dark and rough; hinge strong, curved; a decided lunule showing in front of the beaks, which extends underneath and behind them, and is filled with epidermal matter; pseudo-cardinals strong, ragged, radial; laterals somewhat remote, two in each valve; muscle scars distinct, those of the anterior deep and rough; beak cavities deep, compressed; dorsal scars on the under side of the hinge shelf.

Animal: Inner gills much the larger, mostly free from the abdominal sac; palpi enormous, elongated; mantle of male truncate behind, that of the female produced into a wide, rounded, thickened flap filling the wing of the shell behind; marsupium not observed.

Type *Unio tuberculatus* Barnes.

? *Tritogonia conjugans* B. H. Wright. Pl. IV, fig. 1.

Unio conjugans B. H. Wright, Naut., XIII, 1899, p. 89.

A most remarkable shell, of which only the type, probably a male, is known. I am not certain as to the relationship of this species. It does not have the biangulation at the postbase generally found in male shells of *T. tuberculata* Barnes, but has an almost straight truncation from the postbase to the dorsal region. However, *T. tuberculata* often shows such a truncation when young, and we have shells of this an inch and a half in length which are much like *T. conjugans* would be at the same size.

Genus **PTYCHOBANCHUS** Simpson.

Shell somewhat subtriangular or elliptical, solid, that of the male and female alike; epidermis having hairlike or broken rays; beak sculpture faint, broken, and somewhat doubly looped ridges; hinge strong; pseudo-cardinals stumpy; laterals club-shaped, remote; the muscle scars deep; shell cavity with one or more oblique furrows. Marsupium occupying the entire outer branchiæ in a series of beautiful, wide folds, the ovisacs well marked and rounded below.

Type *Unio phaseolus* Hildreth.

Ptychobanchus clintonensis Simpson. Pl. V, fig. 3.

Shell elongate, elliptical, sometimes slightly obovate, feebly biangulate behind, quite solid; beak sculpture not seen; epidermis somewhat clothlike, dirty olive, the hinder two-thirds of the shell ornamented with delicate, wavy, capillary rays; pseudo-cardinals low, laterals very heavy, remote; muscle scars large and well defined; nacre lurid, with greenish brown blotches.

Length 73, height 40, diam. 22 mm.

Archie's Fork of Little Red river, near Clinton, Ark. Probably extends into Kansas.

This form I at first mistook for a variety of *Unio gibbosus* Bar., but an examination of the animal in a gravid state later on showed me that it is a *Ptychobanchus*. The soft parts of the specimens examined were a dark leaden color, almost blue.

Genus **UNIO** Retzius.

Unio iheringi B. H. Wright. Pl. IV, fig. 5.

Unio iheringi B. H. Wright, Naut., XII, 1898, p. 93.

This shell is rather close to *Unio mitchelli* Simpson, but differs

from it in the character of the beak sculpture, in the rays, the texture of the epidermis, and in the form.

Unio dispalans B. H. Wright. Pl. I, fig. 9.

Unio dispalans B. H. Wright, Naut., XIII, 1899, p. 50.

A member of the *complanatus* group, probably, though it has relations with that of *buckleyi* and *fisherianus*. It is one of those puzzling forms which is a good deal like several things, but not near enough to anything to be referred to it.

Unio lehmani S. H. Wright. Pl. IV, fig. 9.

Unio lehmani S. H. Wright, Naut., X, 1897, p. 138.

A member of the *buckleyi* group.

Unio burtchianus S. H. Wright. Pl. IV, fig. 8.

Unio burtchianus B. H. Wright, Naut., X, 1897, p. 137.

Another member of the *buckleyi* group.

Unio pinei B. H. Wright. Pl. III, fig. 1.

Unio pinei B. H. Wright, Naut., XI, 1897, p. 40.

Near to forms of *U. buckleyi*, but probably distinct.

Unio buxtoni B. H. Wright. Pl. I, fig. 6.

Unio buxtoni B. H. Wright, Naut., XI, 1897, p. 55.

A peculiarly formed member of the *buckleyi* group.

Unio brimleyi S. H. Wright. Pl. IV, fig. 6.

Unio brimleyi S. H. Wright, Naut., X, 1897, p. 138.

A species related to *U. subplanus* Conrad.

Genus **PLEUROBEMA** (Rafinesque) Agassiz.

Shell solid, oval, triangular or rhomboid, usually inflated, inequilateral, with high beaks, their sculpture coarse and broken; epidermis generally tawny, but sometimes brownish or black, often having broken rays and square spots; rest lines strong; hinge heavy, with pseudo-cardinals and laterals; beak cavities shallow, nacre white. Embryos contained in the outer gills alone.

Type *Unio clava* Lamarck.

Pleurobema brevis subelliptica Simpson.

Shell elliptic rhomboid, solid, inflated, slightly biangulate behind; beaks rather high, but compressed, sculptured with strong, irregular corrugations that curve up behind; epidermis tawny, with a few faint posterior rays; rest marks moderate; nacre silvery,

iridescent behind; muscle scars well marked; beak cavities moderate; teeth strong, two laterals in each valve.

Length 55, height 40, diam. 28 mm.

Hardy, Arkansas. Tennessee drainage, probably.

Something like *P. brevis* Lea, but much more inflated, and slightly rayed instead of square blotched, and less rhomboid. Probably a distinct species.

Pleurobema avellana Simpson. Pl. II, figs. 6, 7.

Shell small, solid, inflated, rhomboid elliptical, with a well-developed, rounded posterior ridge; beaks full, badly eroded in the only specimens seen; surface lightly concentrically striate, greenish brown, scarcely rayed, but slightly clouded; two diverging pseudo-cardinals in the left valve and one in the right; two laterals in each valve; muscle scars deep; nacre bluish, iridescent behind.

Length 30, height 20, diam. 15 mm.

Catawba river, Alabama. Collections of Bryant Walker and Lorraine Frierson.

Seems to be near *P. rubellus* Con.

Pleurobema strodeana B. H. Wright. Pl. I, fig. 3.

Unio strodeanus B. H. Wright, Naut., XII, 1898, p. 5.

This species is nearly related to *P. patsaligensis* and *P. simulans*.

Pleurobema harperi B. H. Wright. Pl. I, fig. 10.

Unio harperi B. H. Wright, Naut., XIII, 1899, p. 6.

I am somewhat doubtful whether this is more than a variety of *Unio bulbosus* Lea.

Pleurobema pinkstoni S. H. Wright. Pl. I, fig. 8.

Unio pinkstoni S. H. Wright, Naut., X, 1897, p. 136.

Related to *P. hanleyana* Lea and *P.*

Pleurobema swordiana S. H. Wright. Pl. IV, fig. 4.

Unio swordianus S. H. Wright, Naut., XI, 1897, p. 4.

A puzzling form which may be related to *Unio appressus* of Lea and *U. abacus* of Haldeman. Its shallow beak cavities distinguish it at once from *Unio bursa-pastoris* of B. H. Wright, which it resembles, but which has deep cavities.

Pleurobema patsaligensis Simpson. Pl. II, fig. 1.

Shell rather small, nearly elliptical, subsolid and somewhat inflated, with a well-developed, posterior ridge, sometimes slightly biangulate behind; posterior slope with two or three faint ridges; epidermis a little silky, but shining when rubbed, greenish yellow, with scarcely perceptible rays, and often clouded with bluish green; beaks eroded and the sculpture not seen; hinge curved; pseudo-cardinals radiate, rather stumpy; two laterals in the left valve and one and a vestige of a second in the right; beak cavities moderate, but compressed; naere whitish, often blotched with brown, iridescent behind.

Length 43, height 28, diam. 18 mm.

Little Patsaliga creek, southeast Alabama.

This groups with *P. stodeana* B. H. Wright and *P. simulans* Lea, but is perfectly distinct.

Pleurobema reclusa B. H. Wright. Pl. I, fig. 2.

Unio reclusus B. H. Wright, Naut., XI, 1893, p. 111.

Closely related to *P. harperi* and *bulbosa*.

Pleurobema argentea pannosa Simpson.

Shell rather solid, irregularly and rudely concentrically striate; epidermis where fresh somewhat clothlike, tawny or brownish.

White river and Hot Springs, Ark.

Possibly a variety of *P. argentea*, but it may prove to be a distinct species.

Genus **QUADRULA** (Rafinesque) Agassiz.

Quadrula rudis Simpson. Pl. III, fig. 2.

Shell large, long quadrate, inflated, solid, with high beaks, curved inward and forward, having apparently delicate corrugated sculpture, a decided, sharp, curved posterior ridge ending in a blunt point at the posterior base, in front of which the basal line is incurved, anterior end rounded, posterior end an even curve from the ligament to the postbase; epidermis brownish, rough, rayless; surface sulcate and, excepting the later growth, covered with sharply elevated small pustules which are sometimes united; hinge curved; a single very large pseudo-cardinal in the right valve which fits in a cavity of the left, around which there is a high ridge which develops into a high tooth behind the cavity; under the beaks is a sort of lunule which is extended inward across the hinge

plate, which is partly filled with epidermis; laterals curved, rather delicate; anterior scars deep, those of the adductor very rough in the centre; posterior scars shallow, beak cavities very deep, slightly compressed; front part of the shell greatly thickened; nacre soft, creamy white.

Length 103, height 65, diam. 45 mm.

Rio Taxtunilha, Guatemala.

A single shell, the type, is in the Lea collection, presented to Dr. Lea by C. M. Wheatley, and labelled by the latter *Unio psoriacus* Morelet. It is evidently not that species, and is, I think, new. The type is nearly decorticated.

Quadrula guatemalensis Simpson. Pl. II, fig. 4.

Shell rather small, subrhomboid, solid, scarcely inflated, with a low posterior ridge, above which it is faintly biangulate; beaks moderate, their sculpture not seen; surface sulcate, covered throughout, with rather obsolete pustules and corrugations; epidermis dark brown, rough, rayless; there are two partially united pseudo-cardinals in the left valve, with a pit between them, into which the large tooth of the right valve fits; under and behind the beaks on the hinge plate is a deposit of epidermal matter; beak cavities moderately deep; nacre coppery purple.

Length 45, height 27, diam. 14 mm.

Rio Usumasintæ, Guatemala.

The only shell seen, the type, is probably young. It does not agree with anything I can find described, though it seems to come nearest to *Q. ostreata*.

Quadrula triumphans B. H. Wright. Pl. III, fig. 3.

Unio triumphans B. H. Wright, Naut., XI, 1898, p. 101.

A fine shell which has characters like those of *Q. boykiniana* and *multiplicata*, but which, I think, is neither.

Quadrula flexuosa Simpson. Pl. II, fig. 8.

Shell subtriangular, solid, inflated, with a faintly double posterior ridge, rounded in front and slightly incurved at the posterior base; beaks high, eroded in the only specimen seen; a low, wide, radiating depression leads from them down to the base; epidermis roughly concentrically striate, tawny to brownish, showing the rest marks; hinge plate wide and flat; pseudo-cardinals low, diverging, ragged; laterals straight, short, two in each valve; anterior adduc-

tor scars deep, rough; posterior scars distinct; naere lurid whitish, dull.

Length 65, height 55, diam. 33 mm.

Holston river, Tennessee. Collection of L. S. Frierson.

Apparently nearest to *Q. plena*, but not so high or inflated.

Genus **NODULARIA** Conrad.

Shell elliptical to elongated, inflated; beaks not prominent, sculptured with some form of zigzag, radiating sculpture, which often extends over part or all of the shell; epidermis generally greenish, often bright; hinge provided with pseudo-cardinals and laterals which are usually somewhat compressed; beak cavities shallow; naere whitish. Marsupium occupying the inner gills only.

Nodularia cylindracea Simpson.

Unio grayanus Schrenck (non Lea), Reis. und Forsch. im Amurlande, 1867, p. 694, Pl. XXVII, figs. 1-3.

Shell greatly elongated, inflated, rather solid and slightly arcuate, very inequilateral, rounded in front, with a low, rounded posterior ridge which runs to the postbase, where the shell ends in a somewhat rounded point, above which it is obliquely subtruncated; ligament large, long; surface apparently without sculpture save for slight concentric ridges; epidermis thick, brown, and in the shell figured cracking and peeling off; dorsal line wavy at the hinder end where the point of the shell turns a little to the right; pseudo-cardinals apparently broken up into several slightly curved denticles; anterior muscle scars deep and large.

Length 155, height 45, diameter 38 mm.

China.

Schrenck supposes this to be Lea's *Unio grayanus*, which is a smaller shell, is always more or less nodulous and corrugated, and has a pinched up posterior ridge and different pseudo-cardinals. He has three shells from a London dealer said to come from China. The specimen figured is very badly eroded on the dorsal region, and is apparently damaged at the postbase, while the heavy epidermis has peeled off in a number of places. I do not think it should group with *N. grayana*.

Genus **PSEUDODON** Gould.

Pseudodon loomisi Simpson. Pl. IV, fig. 7.

Shell elongated elliptical and slightly obovate, somewhat inflated, rather thin; beaks not high, the sculpture not seen; poste-

rior ridge low, rounded; posterior slope having a few corrugations running in a nearly horizontal direction, the rest of the shell nearly smooth; epidermis black, rayless; there is a single rather elevated tooth in each valve, there being a vestige of a second in the right valve; laterals represented by a low, rounded ridge; beak cavities shallow; muscle scars well marked; nacre pale bluish, becoming a lurid salmon in the cavities.

Length 73, height 37, diam. 23 mm.

Asaka, Japan. Loomis.

This seems to be a rather peculiar *Pseudodon*.

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